

WE CLAIM:

1. A controller for positioning on a shelf of a data storage cabinet in a mass storage system, comprising:

an interface to a data communication loop linked to  
5 device enclosures each including a plurality of data devices  
and an enclosure processor, wherein the interface is adapted  
for transmitting control commands onto the data  
communication loop;

a cabinet bus interface controller linked to a cabinet  
10 bus in the data storage cabinet and adapted to receive  
enclosure reporting messages from the device enclosures  
including environmental information for the device  
enclosures and to transmit subenclosure messages including  
environmental information for the controller; and

15 a processor for creating the control commands and the  
subenclosure messages.

2. The controller of Claim 1, wherein the control  
commands are addressed to one of the device enclosures  
designated as a primary reporting device.

20 3. The controller of Claim 2, wherein the processor  
functions to designate the primary reporting device.

4. The controller of Claim 3, wherein the processor  
functions to change the primary reporting device designation  
to a different one of the device enclosures.

25 5. The controller of Claim 1, wherein at least one of  
the device enclosures is positioned in a data storage  
cabinet differing from the data storage cabinet housing the  
controller and wherein the two data storage cabinets are

communicatively-linked with a cabinet communication network,  
the different data storage cabinet including a cabinet bus  
linked to the cabinet communication network to provide a  
communication path for the enclosure reporting messages from  
5 at least one of the device enclosures.

6. The controller of Claim 1, wherein the cabinet bus  
interface controller is configured to receive cabinet  
identification and shelf identification signals from the  
cabinet bus and to determine a shelf identifier from the  
10 shelf identification signals, and wherein the subenclosure  
messages include the shelf identifier and the cabinet  
identification.

7. The controller of Claim 1, wherein the enclosure  
reporting messages comprise SCSI-3 Enclosure (SES) data.

15 8. The controller of Claim 1, the cabinet bus  
interface controller emulates a memory image to the  
processor including read only memory, non-volatile read and  
write memory, and read and write memory.

9. The controller of Claim 8, wherein the read only  
20 memory includes a shelf identifier field for storing a shelf  
identifier for the controller and a cabinet number field for  
storing a cabinet identifier for the data storage cabinet.

10. The controller of Claim 8, wherein the cabinet bus  
interface controller transmits interrupt signals to the  
25 processor based on changes to the memory image.

11. A method of controlling communications in a data  
storage complex, comprising:

providing a controller including a processor for creating and transmitting control commands and a cabinet bus interface controller for providing an interface between the processor and other devices in the storage complex; and

5       communicatively linking the controller to a plurality of enclosures with a data communication loop and with a cabinet bus, wherein the control commands are transmitted over the data communication loop and wherein environmental status messages are received by the controller over the  
10 cabinet bus.

12. The method of Claim 11, wherein the cabinet bus interface controller includes a data structure for storing a reporting group assignment for the controller and wherein the cabinet bus interface controller is configured to, prior  
15 to the receiving, determine whether the environmental status messages on the cabinet bus originate from ones of the enclosure assigned to the controller reporting group.

13. The method of Claim 12, further including determining with the cabinet bus interface controller from  
20 signals on the cabinet bus a shelf position of the controller within a cabinet in the data complex.

14. The method of Claim 12, further including determining ones of the enclosures participating in the controller reporting group.

15. The method of Claim 11, wherein each of the enclosures includes a plurality of devices linked to the data communication loop and further including bypassing malfunctioning ones of the devices on the data communication  
5 loop.

16. The method of Claim 15, wherein the bypassing is performed on a targeted one of the enclosures within a targeted cabinet in the data storage complex.